# The Romance of Steam Boilers.

JOHN THOMPSON (WOLVERHAMPTON) LTD.
WOLVERHAMPTON, ENGLAND.

# JOHN THOMPSON (Wolverhampton) LTD.

*Head Offices:*

WOLVERHAMPTON
ENGLAND.

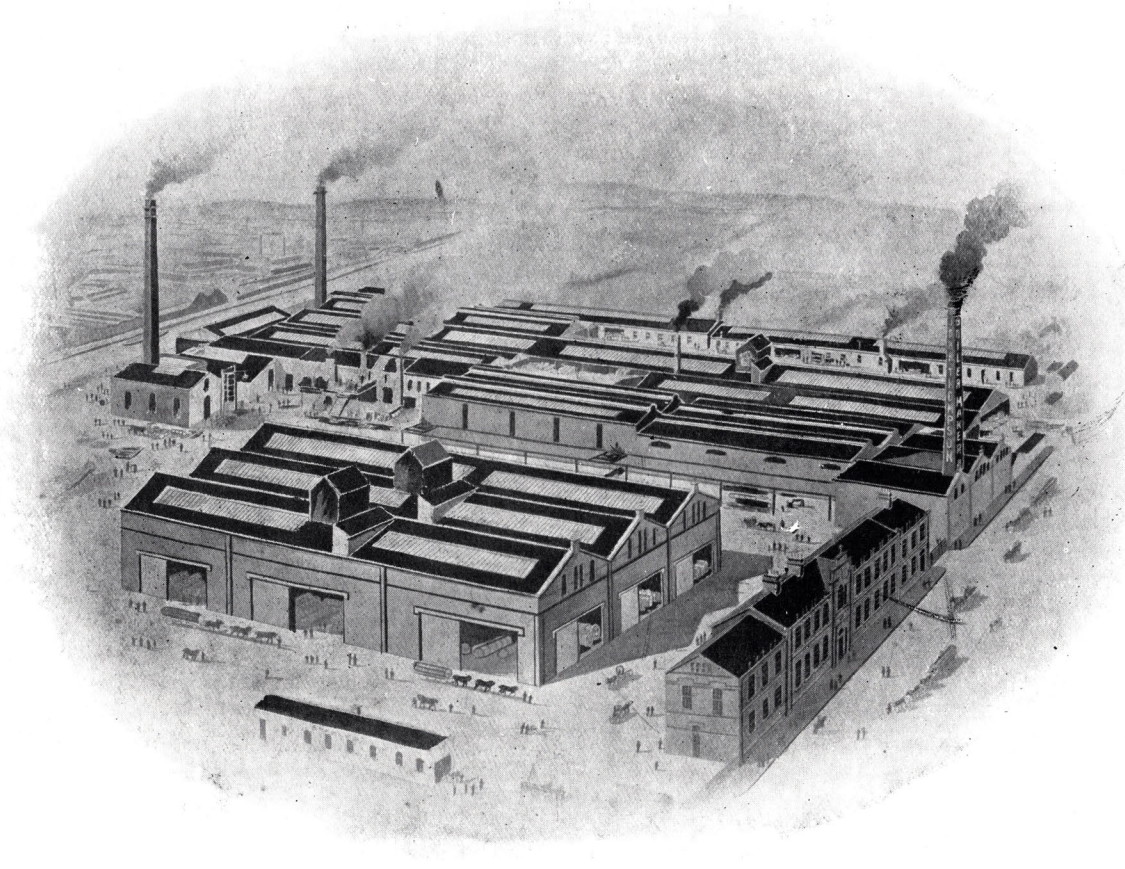
*Telephones* { 1138 (3 lines) WOLVERHAMPTON.
92 BILSTON.
426 REGENT, LONDON.

*Telegrams:*
"BOILER, WOLVERHAMPTON."

# JOHN THOMPSON (WOLVERHAMPTON) LTD.

## ENGINEERING WORKS,

ON
WAR OFFICE,
ADMIRALTY
AND
AIR MINISTRY
LISTS.



CONTRACTORS
TO
INDIAN STATE
RAILWAYS,
JAPANESE
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CROWN AGENT
TO
THE COLONIES,
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*GOVERNING DIRECTORS:*
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A. E. THOMPSON
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S. J. THOMPSON

*DIRECTORS:*
E. BRAZIER
D. A. HILL
J. JEAVONS
P. L. TURNER
A. JEAVONS
W. E. PINNEGAR.

# WOLVERHAMPTON, ENGLAND.

**Also Branch Works at DUDLEY and BILSTON.**

# "JOHN THOMPSON" BOILERS

## (WITH DISHED ENDS AND CORRUGATED FLUES).

**On Admiralty and War Office Lists.**

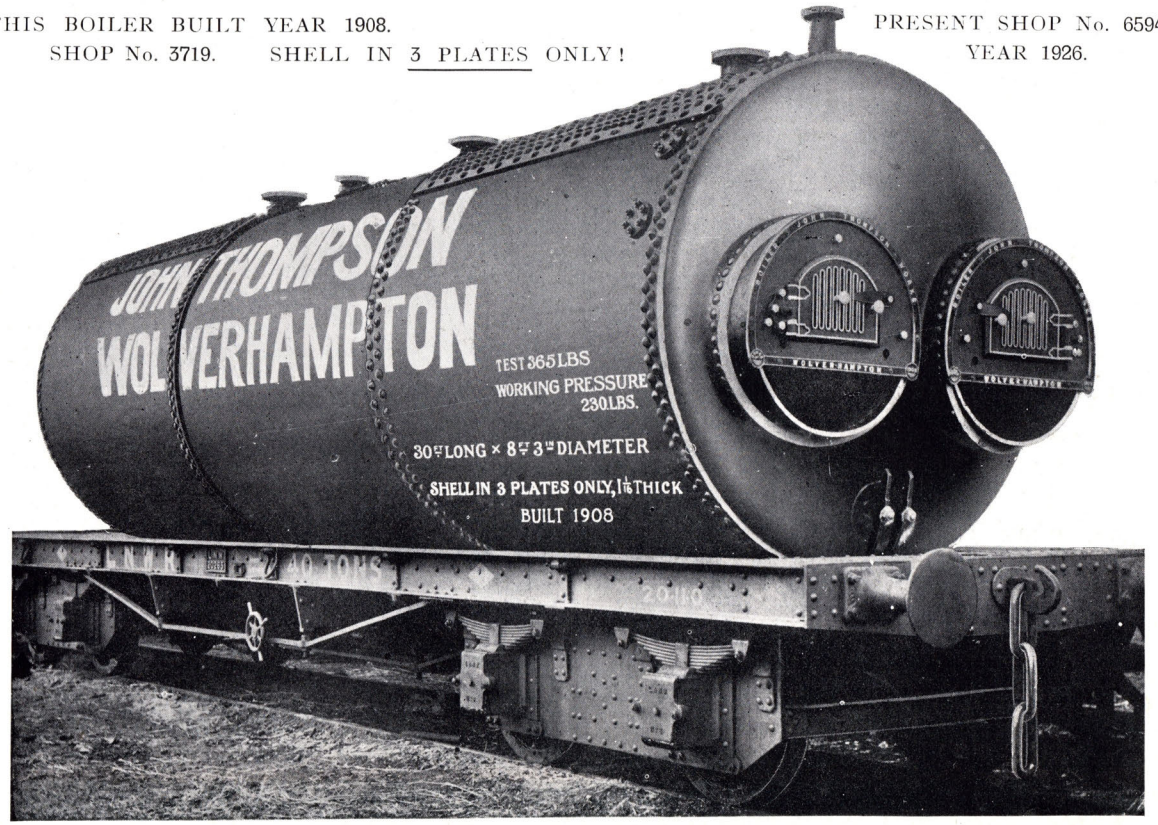
**Over 1,000 men employed.**

**Wolverhampton Works.**

**Capacity:— One Boiler per Working Day.**

THIS BOILER BUILT YEAR 1908.
SHOP No. 3719. SHELL IN 3 PLATES ONLY!

PRESENT SHOP No. 6594.
YEAR 1926.




HAS WORKED FOR 17 YEARS, AND STILL WORKING, AT 230lbs. DAILY PRESSURE.

After working for 17 years at 230lbs. daily pressure, the users of this **"JOHN THOMPSON"** Dish-ended Boiler (MESSRS. KIRKPATRICK BROS., LIMITED, Bleachers, Dyers & Finishers, Ballyclare, co. Antrim) write under date July 27, 1921:

"THE BOILER HAS BEEN WORKING MOST SATISFACTORILY SINCE ITS INSTALLATION: IT HAS NOT GIVEN THE SLIGHTEST TROUBLE, AND WE CONSIDER IT A GOOD STEAMING BOILER."

---

BUILT UNDER THE INSURANCE COY.'S INSPECTION.

# JOHN THOMPSON (WOLVERHAMPTON) LTD.

## WOLVERHAMPTON, Eng.

**Branch Works at DUDLEY & BILSTON.**

*Governing Directors:*
JAMES THOMPSON
A. E. THOMPSON
W. J. THOMPSON
S. J. THOMPSON

*Directors:*
E. BRAZIER
D. A. HILL
J. JEAVONS
P. L. TURNER
A. JEAVONS
W. E. PINNEGAR.

WE have pleasure in submitting the 16th issue of our Catalogue of our Speciality THE "JOHN THOMPSON" BOILER (with Dished Ends and Corrugated Flues). During the past twenty years we have constructed over 4,000 of this type, their important constructional advantages having been recognised by Engineers, so much so that we now build them in the proportion of twenty to one of the old-fashioned Flat End type Boiler, which they have superseded.

They are the best Boiler construction, there being no Stays whatever, no Stay Rivets with liability of leakage, more freedom for expansion and contraction strains, and the absence of Stays facilitates cleaning.

A few years ago we adopted as our general Standard the insertion of a "CORRUGATED SECTION" in our Boilers, about one-quarter the length of the Flue: this improvement is in accordance with the best Marine Boiler Practice: the Corrugations not only give extra valuable Heating Surface, but the flame impinging upon them enables the full heat value to be obtained from the fuel, added to which this type of Flue is the better adapted to take up the expansion and contraction strains which are set up in all internally fired Boilers. We have put down a **SPECIAL CORRUGATING PLANT** for manufacturing these Flue Sections, and we are the only Boiler Makers in the United Kingdom who have such Special Machinery for **ROLLING** our own Corrugated Flues.

Over 1,200 men are employed at our Works at Wolverhampton, Dudley and Bilston, which are equipped with all the most modern Plant and Machinery, Electric, Pneumatic and Hydraulic, for construction of Boilers of the highest pressures and largest units.

We can build up to 10-ft. diameter, and for Working Pressures up to 230-lbs. per square inch, and have the only Plant in the Country to build these large 9-ft. 3-in. and 10-ft. diameter Boilers, with three Plates only in the shell, thus eliminating a large number of joints and rivets.

Telegrams and Cables :—
"BOILER," WOLVERHAMPTON, England.

Codes :—
A. B. C., 5th and 6th Editions. ENGINEERING. LIEBER'S. PRIVATE.
WESTERN UNION. MARCONI. SELL'S. BENTLEY'S.

Telephones :—
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2386 DUDLEY.
REGENT 426 LONDON.

## BRITISH OFFICES :

**South Wales :**

Principality Buildings,
Queen Street,
Cardiff.

D. Ll. Evans & Major,
3, Dock Chambers,
Cardiff.

**Scotland :**

50, Wellington Street,
Glasgow.

**London Office :**

"Imperial House,"
Kingsway, W.C.2.

**Yorkshire Office :**

42, Royal Exchange Chambers,
City Square,
Leeds.

**Nottingham Office :**

Milton Chambers,
Milton Street.

**Manchester Office :**

"King's House,"
King Street West.

**Branch Works :**

# Windmill Works, Dudley.

---

# Alice Street, Bilston.

---

**A CENTURY OF BOILER MAKING**

## FOREIGN OFFICES :

**Australia :**

312, Flinders Street,
MELBOURNE.

Ferrier & Dickinson,
Royal Exchange,
Bridge Street,
SYDNEY.

**India :**

"Fairlie House,"
4, Fairlie Place,
CALCUTTA.

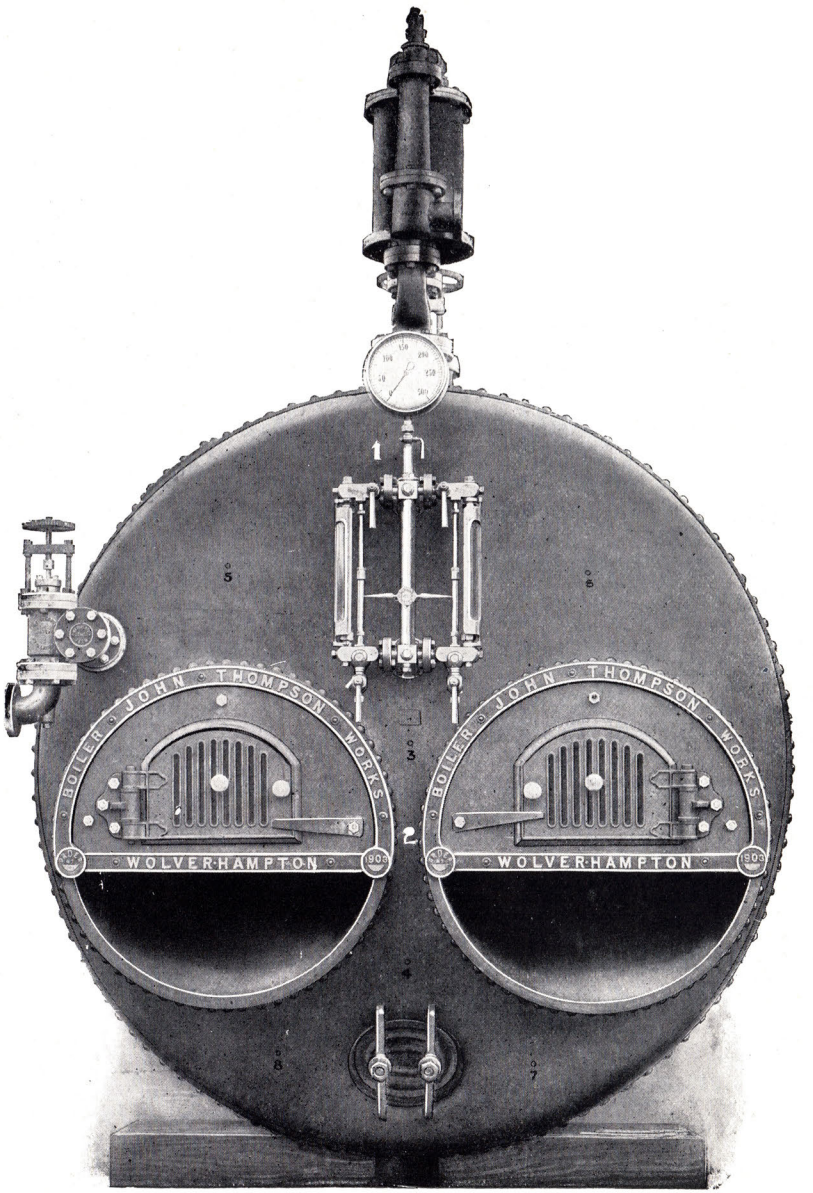
## Table shewing Deflections of Dished Ends under Hydraulic Test, at various pressures.

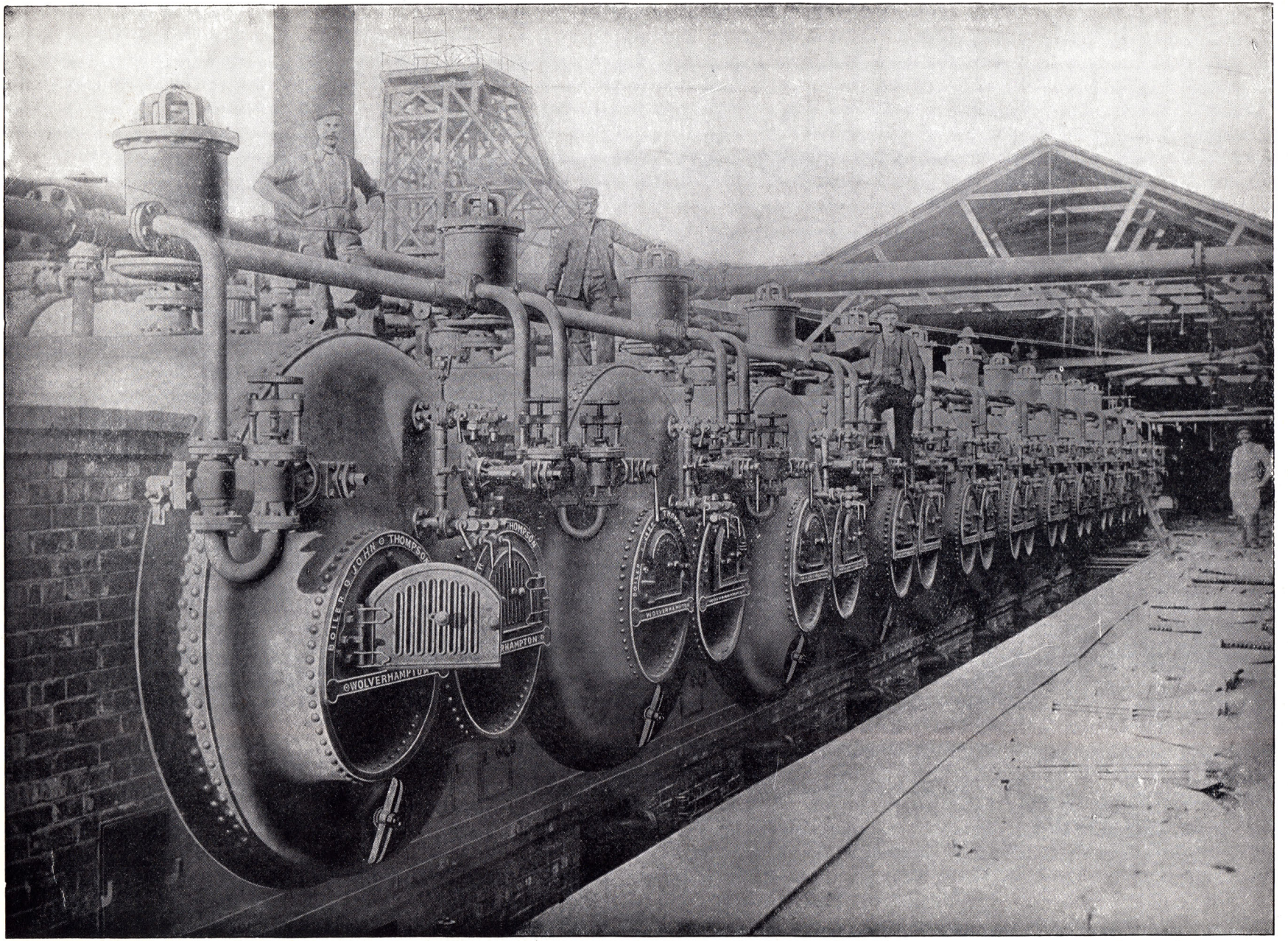
### (Front End.)

| TIME. | P.M. | 2.55 | 3.20 | 3.35 | 3.50 | 4.4 | 4.15 | Max. Deflec'ns obtained. |
|---|---|---|---|---|---|---|---|---|
| Pressure lbs. per sq. inch | 0 | 95 | 120 | 145 | 170 | 195 | 0 | |
| Position No. on Boiler | MEASUREMENTS IN INCHES. | | | | | | | |
| 1 | $5\frac{10}{32}$ | $5\frac{10}{32}$ | $5\frac{10}{32}$ | $5\frac{10}{32}$ | $5\frac{9}{32}$ | $5\frac{8}{32}$ | $5\frac{10}{32}$ | $\frac{5}{64}$ |
| 2 | $6\frac{2}{32}$ | $5\frac{29}{32}$ | $5\frac{29}{32}$ | $5\frac{30}{32}$ | $5\frac{30}{32}$ | $5\frac{30}{32}$ | $6\frac{2}{32}$ | $\frac{9}{64}$ |
| 3 | $5\frac{23}{32}$ | $5\frac{22}{32}$ | $5\frac{22}{32}$ | $5\frac{21}{32}$ | $5\frac{20}{32}$ | $5\frac{20}{32}$ | $5\frac{23}{32}$ | $\frac{6}{64}$ |
| 4 | $8\frac{1}{32}$ | 8 | $7\frac{31}{32}$ | $7\frac{29}{32}$ | $7\frac{29}{32}$ | $7\frac{28}{32}$ | $8\frac{1}{32}$ | $\frac{9}{64}$ |
| 5 | $9\frac{28}{32}$ | $9\frac{25}{32}$ | $9\frac{25}{32}$ | $9\frac{24}{32}$ | $9\frac{24}{32}$ | $9\frac{23}{32}$ | $9\frac{28}{32}$ | $\frac{10}{64}$ |
| 6 | $10\frac{1}{32}$ | $9\frac{29}{32}$ | $9\frac{28}{32}$ | $9\frac{27}{32}$ | $9\frac{27}{32}$ | $9\frac{26}{32}$ | $10\frac{1}{32}$ | $\frac{13}{64}$ |
| 7 | $11\frac{8}{32}$ | $11\frac{6}{32}$ | $11\frac{5}{32}$ | $11\frac{4}{32}$ | $11\frac{4}{32}$ | $11\frac{4}{32}$ | $11\frac{8}{32}$ | $\frac{6}{64}$ |
| 8 | $11\frac{14}{32}$ | $11\frac{12}{32}$ | $11\frac{11}{32}$ | $11\frac{11}{32}$ | $11\frac{10}{32}$ | $11\frac{10}{32}$ | $11\frac{14}{32}$ | $\frac{7}{64}$ |

The deflections shewn by the Test on the Back End were nearly the same as above. Official Report of Tests will be sent on application.

Hundreds of The "John Thompson" Boilers with Dished Ends and Corrugated Flues have been built under the inspection of the leading Insurance Companies, to whom we are indebted for helpful suggestions.






**12 "JOHN THOMPSON" BOILERS (with Dished Ends and Corrugated Flues),** suitable for **160** lbs. per square inch working pressure. Delivered and erected by us at South African Mines.

# THE "JOHN THOMPSON" BOILER

**(WITH DISHED ENDS AND CORRUGATED FLUES).**

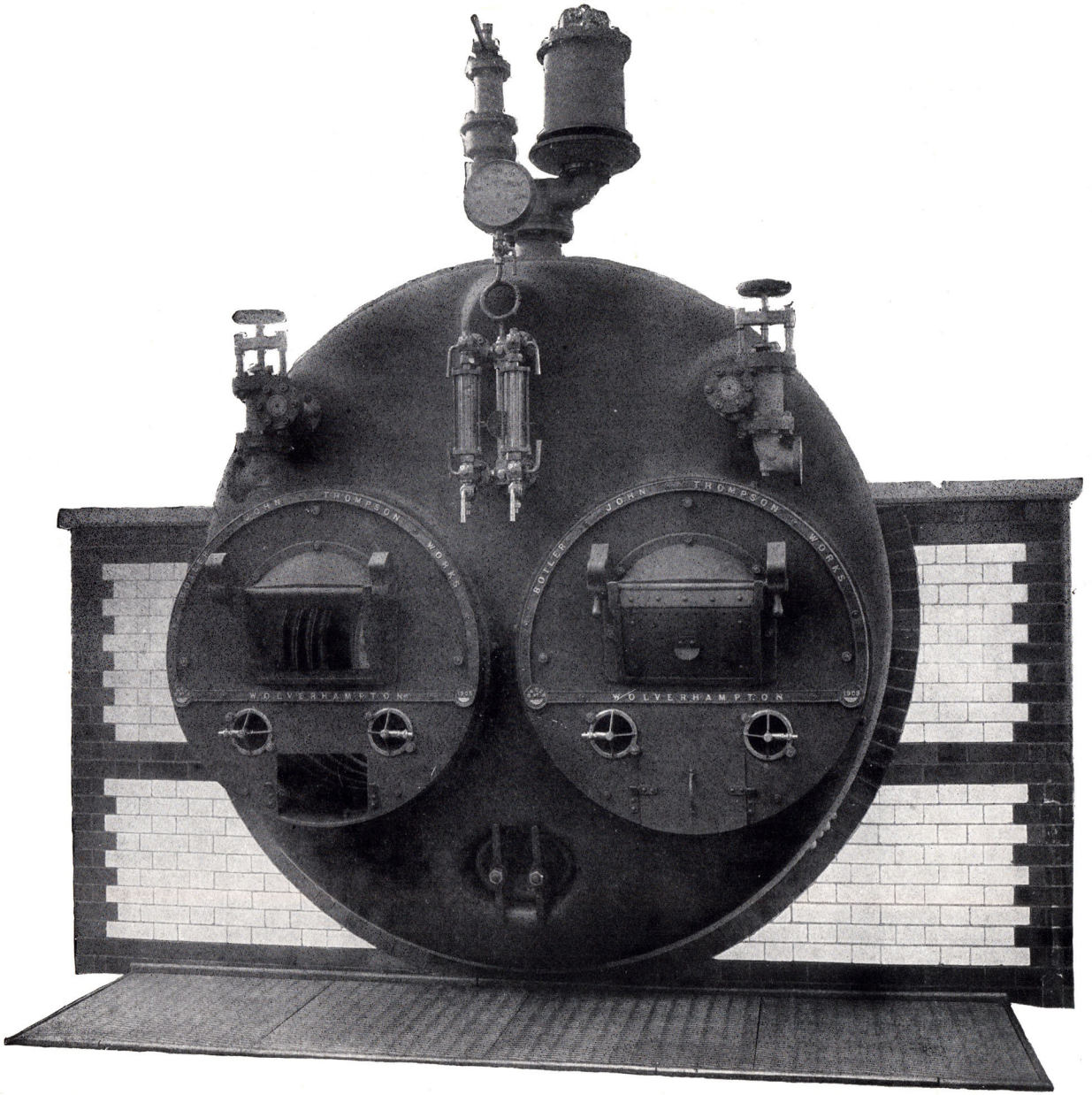
We would draw your particular attention to our Type "A," "John Thompson" Boiler (with Dished Ends and Corrugated Flues) of which we are the Pioneers in English-speaking Countries, and which was awarded the **Diploma of Honour** at the Franco-British Exhibition in 1908, and Japan-British Exhibition in 1910.

**EXPERIENCE.** Being established 86 years, we have gained experience quite unique in the manufacture of Boilers of all types, regarding which we have also accumulated a large amount of valuable information and data, which we are happy to place at the disposal of prospective buyers.

**WORKS.** New Works have recently been erected, being equipped with electrical, steam, hydraulic, and pneumatic tools of most modern design, &c. All holes are drilled, plate edges planed, rivetting by hydraulic, caulking by pneumatic, flues heated by water gas and welded by special hydraulic rolling machine.

**ORDERS.** To secure the highest-class Boilers, Customers should specify when placing orders for Boilers, etc., through their usual Commission Houses, that the Boilers wanted are those manufactured by **John Thompson (Wolverhampton) Ltd.;** to ensure this, purchasers should at time of ordering forward to us direct, copy of their specification and particulars, thus avoiding misunderstanding and delay in execution.

**BOILERS AND ACCESSORIES.** In addition to the "John Thompson" Boiler (with Dished Ends and Corrugated Flues), we also manufacture Boilers of the **ordinary Lancashire type** (with flat ends and angle ring, flanged ends or inverted ends), Cornish, Vertical, Economic, Dry Back and Water Tube Boilers, as also all kinds of Boiler Accessories, of which detailed Catalogues will be forwarded on application.




**"JOHN THOMPSON" BOILER (with Dished Ends and Corrugated Flues),** 30-ft. × 9-ft. 3-in. × 200 lbs. W.P., Type "A."
Exhibited at the Japan-British Exhibition in 1910, and awarded **"Diploma of Honour."**

# Advantages of the "John Thompson" Boiler

(WITH DISHED ENDS AND CORRUGATED FLUES). Type "A."

**No gusset stays or rivets,** ends being "dished" and increased in thickness to give the required factor of safety satisfactory to all Insurance Companies.

All rivets connecting end plates to shell and flues, subject to **shearing** instead of tensile strain and rivetted by hydraulic power.

End plates being flanged to shell of boiler, **no angle rings** are required.

Cleaning boiler internally more easily done, there being no stays.

Corrugated Flues give **15 to 18 per cent.** valuable **increased heating surface.**

Corrugations baffle the flame, and cause it to impinge upon them; therefore **full value** is obtained **from the heat,** instead of the flame flowing along a smooth surface, as in the case of ordinary plain flues.

**Increased life** through equality of expansion and contraction.

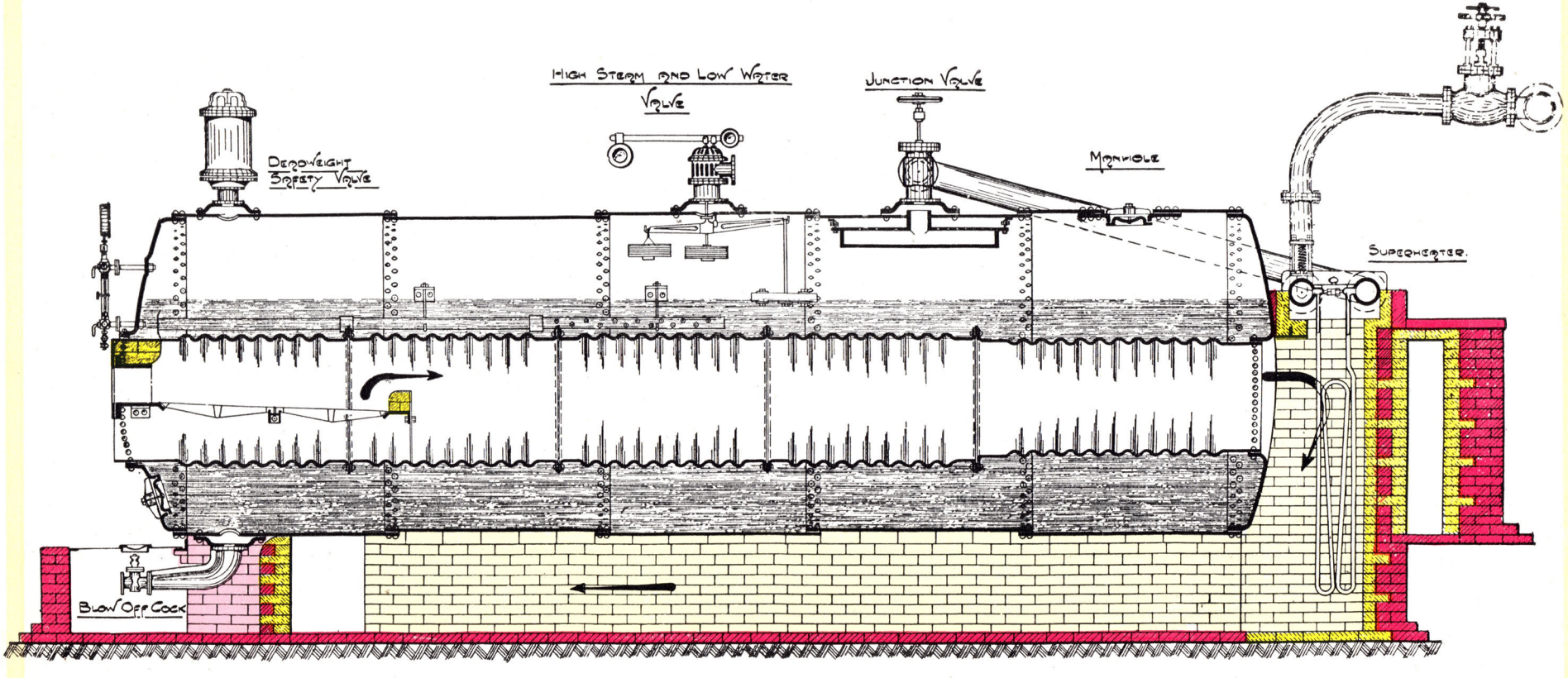
**Reduced joints and rivets** in flues by 90 per cent. as compared with ordinary flanged flues.

**Fuel economy** is obtained by using Corrugated Flues, a fact which is thoroughly appreciated by users.

**Increased Evaporative Efficiency.**

# "John Thompson" Boilers

(With DISHED ENDS and CORRUGATED FLUES), and "THOMPSON" PATENT SECTIONAL SUPERHEATER




MADE TO THE ENTIRE SATISFACTION OF ALL THE LEADING INSURANCE COMPANIES, WITHOUT EXTRA COST.

**Contractors to Admiralty, War Office, Indian State Railways, Crown Agents to Colonies, Japanese Government, etc.**

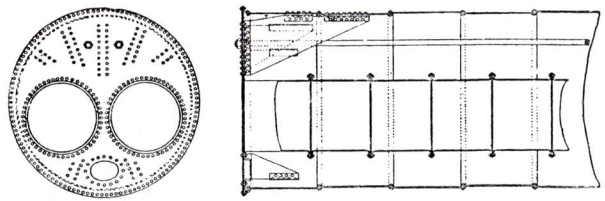
For Modern Construction, Fewness of Joints and Rivets, Efficiency, Economy and Simplicity, specify :—

**"John Thompson's" Own Make Boiler (with Dished Ends and Corrugated Flues).**

# Boiler Construction.

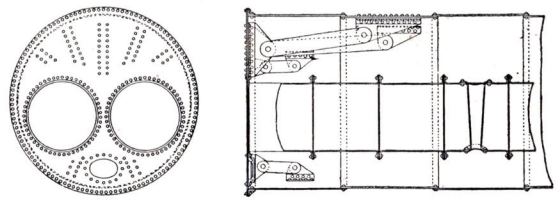
## Evolution of Lancashire Boilers during the past 80 years.

**Fig. 1.**



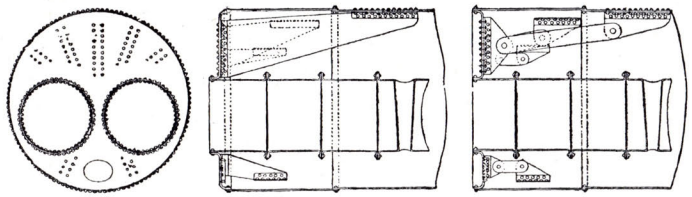
1840 to 1880.—Flat Ends with Angle Ring. Internal Gusset Stays with Double Angles (over 500 rivets required for these). 2 Longitudinal Stay Rods. Shell in 9 Plates.

**Fig. 2.**



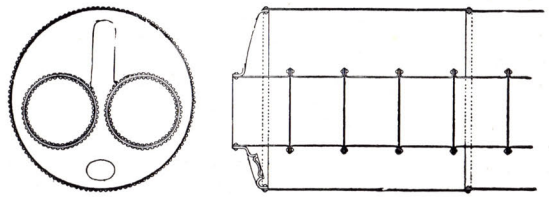
1895.—Flat Ends, as Fig. 1, with Angle Ring at front, and Rivetted Crosstubes, but with Link Stays, and Shell in 7 Plates.

**Fig. 3.**



Flat Ends, with gusset stays and angles, but ends flanged inwards or outwards, obviating the necessity of angle ring, and flanged outwards for attachment to Flues, to prevent grooving at that point, which was continually taking place in Figs. 1 and 2. The Flues being carried well out, wet ashes did not lie against the Front End to cause corrosion and pitting. Shell in 6 Plates, and Crosstubes Welded.

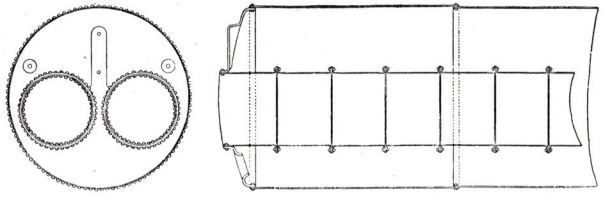
**Fig. 4.**



1900.—"John Thompson" Dished Ends, possessing the advantages of Fig. 3, but with ends dished to a convex form, and slightly increased in thickness, thus entirely dispensing with internal stays, and some 500 rivets, and rendering Boiler more accessible for Cleaning. Ends flanged square at front. Blocks rivetted for Water Gauges and Feed Valve. Shell in 5 Plates. No Crosstubes.

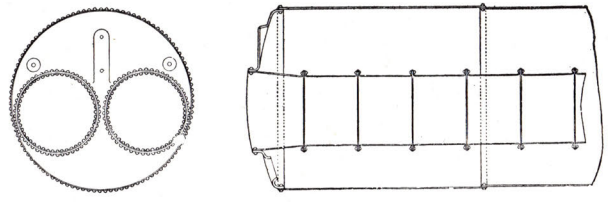
## BOILER CONSTRUCTION—continued.

**Fig. 5.**



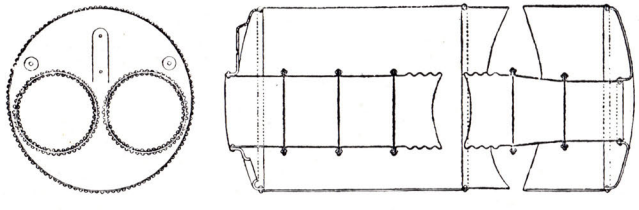
1901.—"John Thompson" Dished Ends, as Fig. 4, but with Flues at front flanged to sweep of End, and with provisions for Steam Gauge and Feed Valve (either side of Boiler), pressed from the Solid Plate, thus removing all rivets, except those where Shell and Flues are connected to End Plate.

**Fig. 6.**



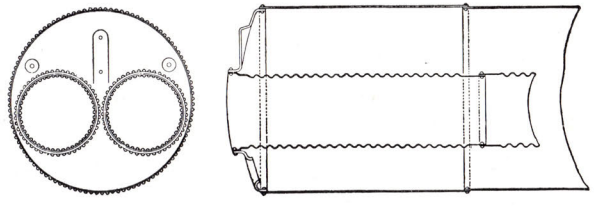
1902.—"John Thompson" Dished Ends, as Fig. 5, with Flue Holes in Front End flanged to sufficient size, that flues may be withdrawn and refixed without removing End Plate thus forming the "JOHN THOMPSON" Dish-Ended Boiler with PATENT REMOVABLE FLANGED FLUES.

**Fig. 7.**



1906.—"John Thompson" Dished Ends, as Fig. 5, but with Corrugated Section Type "C," which latter gave valuable increased heating surface, and extra flue expansion.

**Fig. 8.**



1908.—The Most up-to-date Boiler in Construction, Efficiency and Simplicity, possessing all the advantages of the past 84 years. SHELL IN 3 PLATES. FLUES CORRUGATED THROUGHOUT. (For detailed advantages see page 10.) Type "A."

## EARLY TYPES OF FLUE CONNECTIONS.

**1838. Lap Joint**

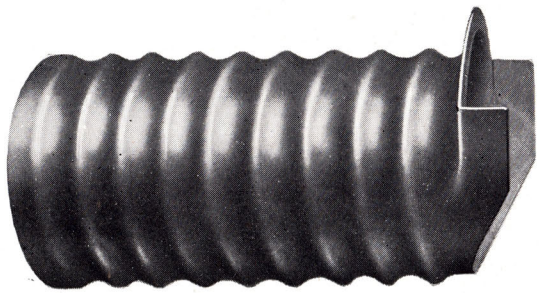
**1848. Tee Strengthening Ring.**

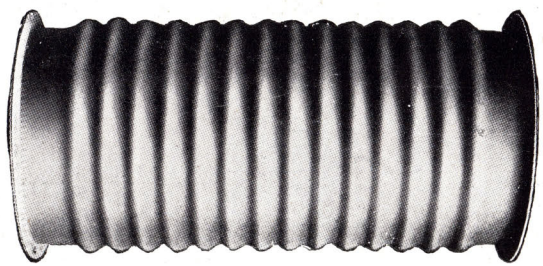
**1868. Bowling Hoops.**

**1875. Flanged Expansion Joints.**

# CORRUGATED FLUE SECTIONS.

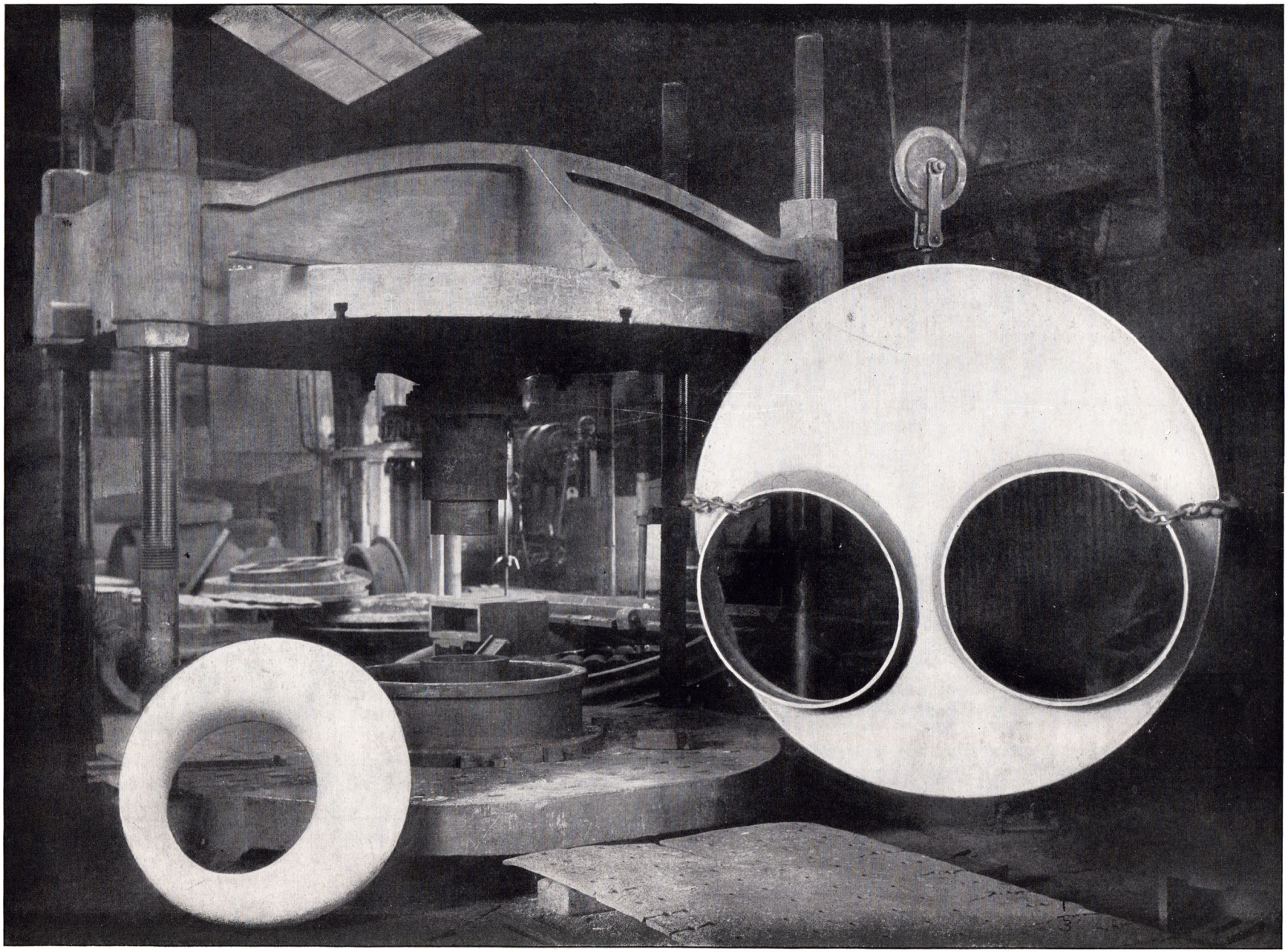
## FOR MARINE AND LAND BOILERS.



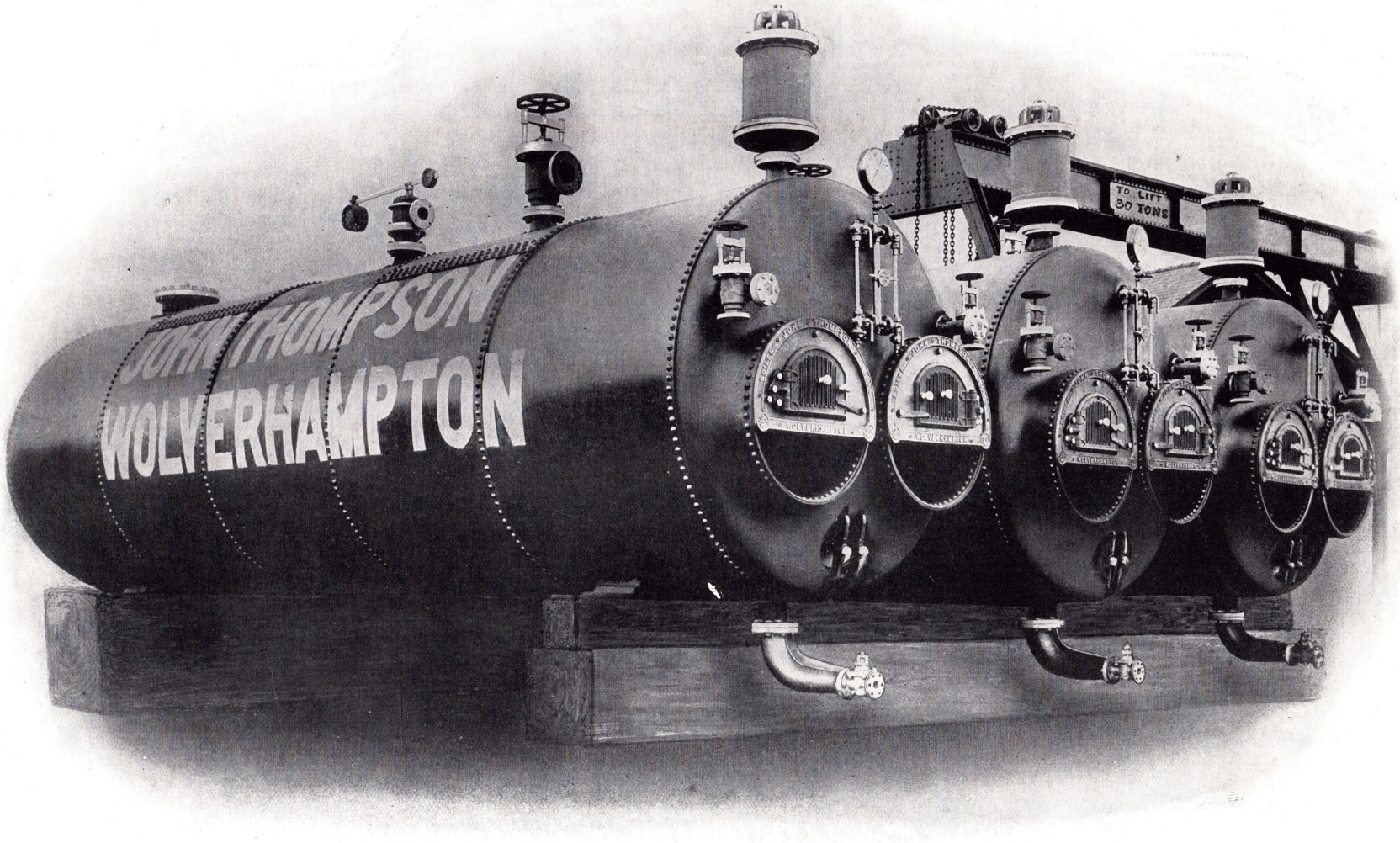


**"FOX," "DEIGHTON"** and **"MORRISON"** Types (with Stephen Gourlay Ends or Wing Type Flanges).
**Quick Despatch.**

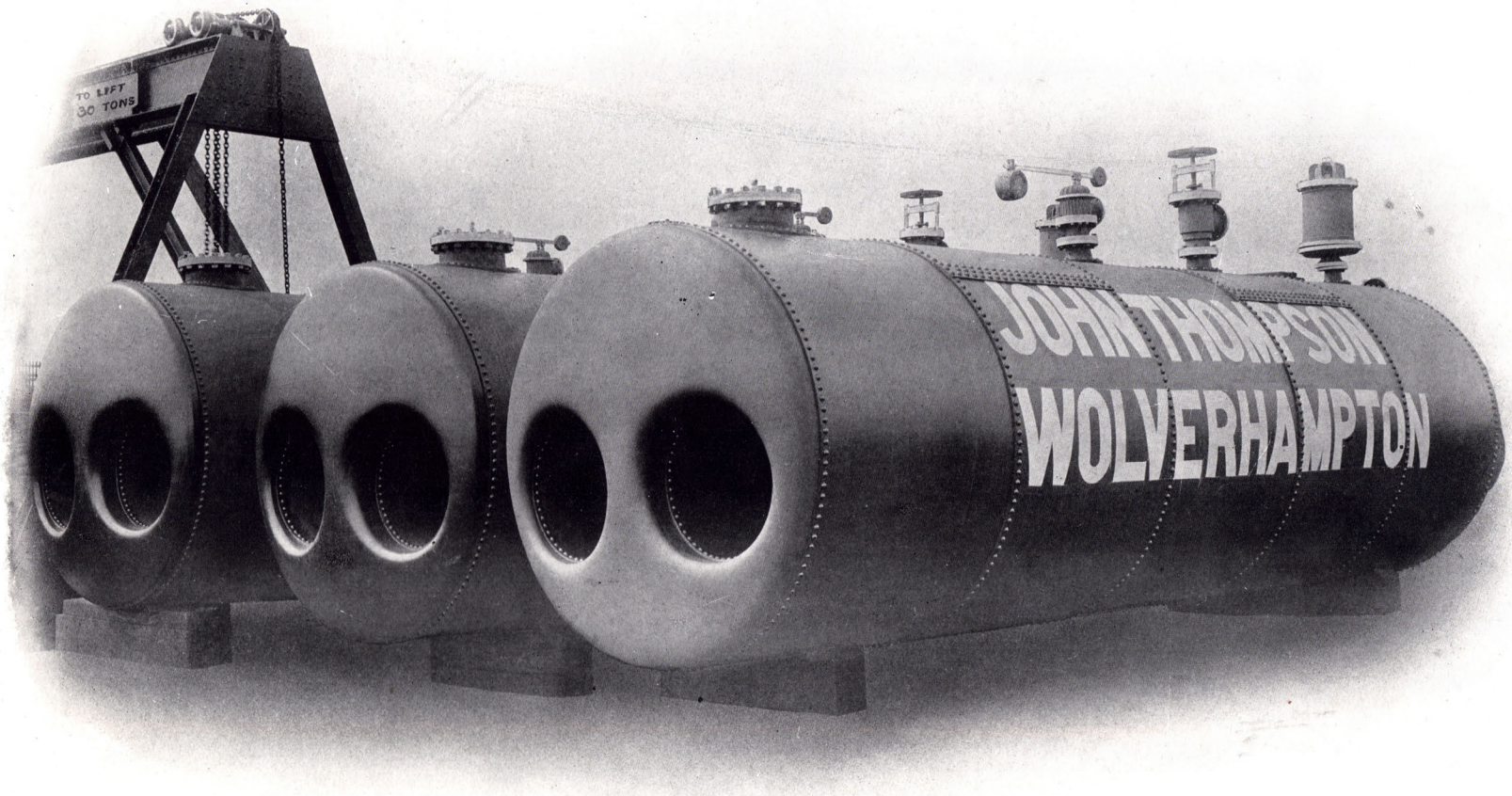
**LATEST TYPE CORRUGATING PLANT** installed at these Works for Rolling these Sections at one heat.



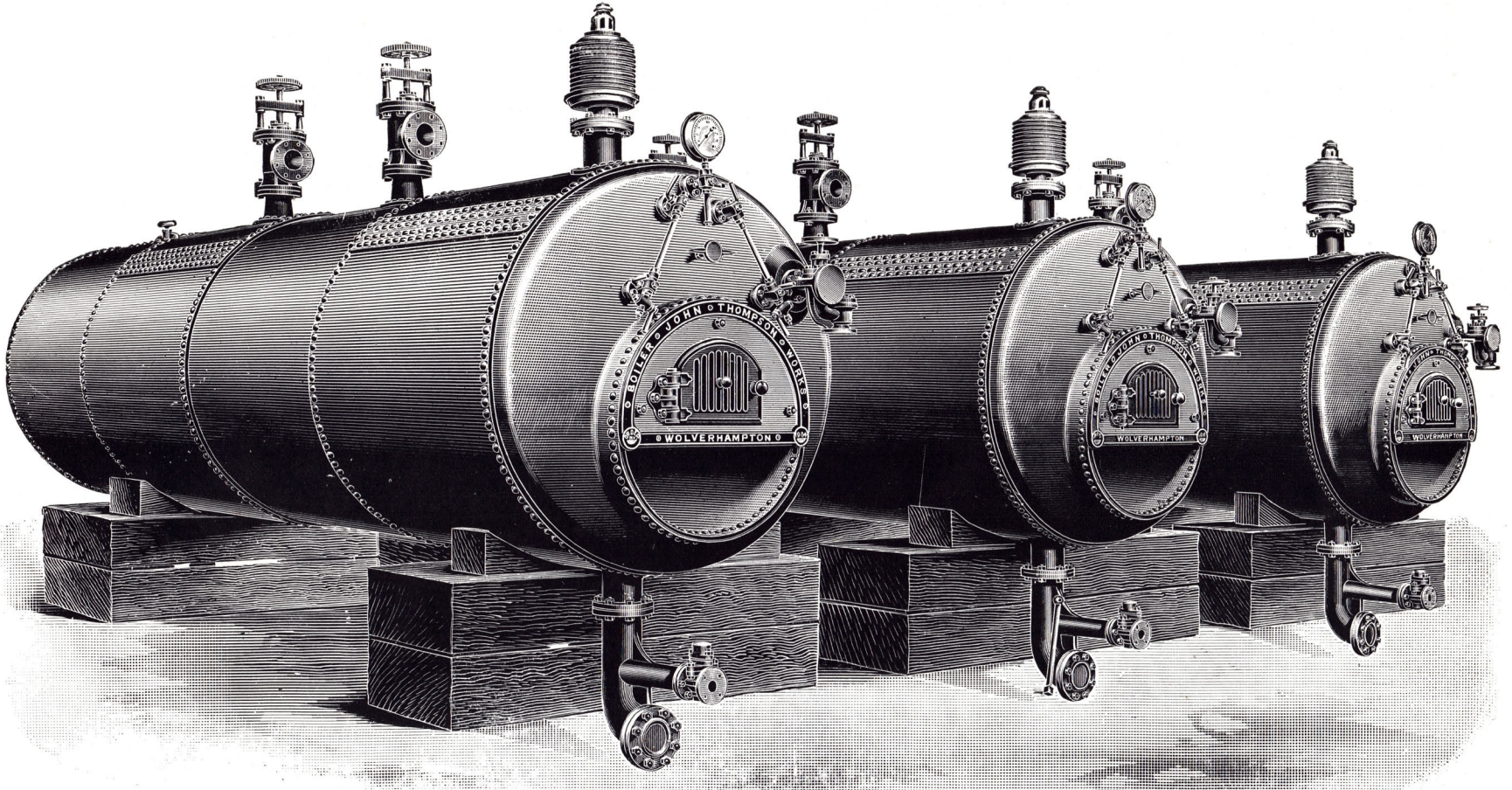
**HEAVY HYDRAULIC PRESS** at our Wolverhampton Works, for dishing and flanging of "John Thompson" Boiler Ends.




**FRONT END VIEW** of **3** "JOHN THOMPSON" BOILERS (with Dished Ends and Corrugated Flues) for South America.




**BACK END VIEW** of Boilers on opposite page.




**"JOHN THOMPSON" CORNISH BOILERS (with Dished Ends).**

24-ft. 6-in. × 6-ft. 3-in. × 150 lbs. W.P. supplied to Waterworks. Standard sizes in stock.

# PIPEWORK.

## PIPES and ACCESSORIES for STEAM, FEED and EXHAUST MAINS

SUITABLY DESIGNED

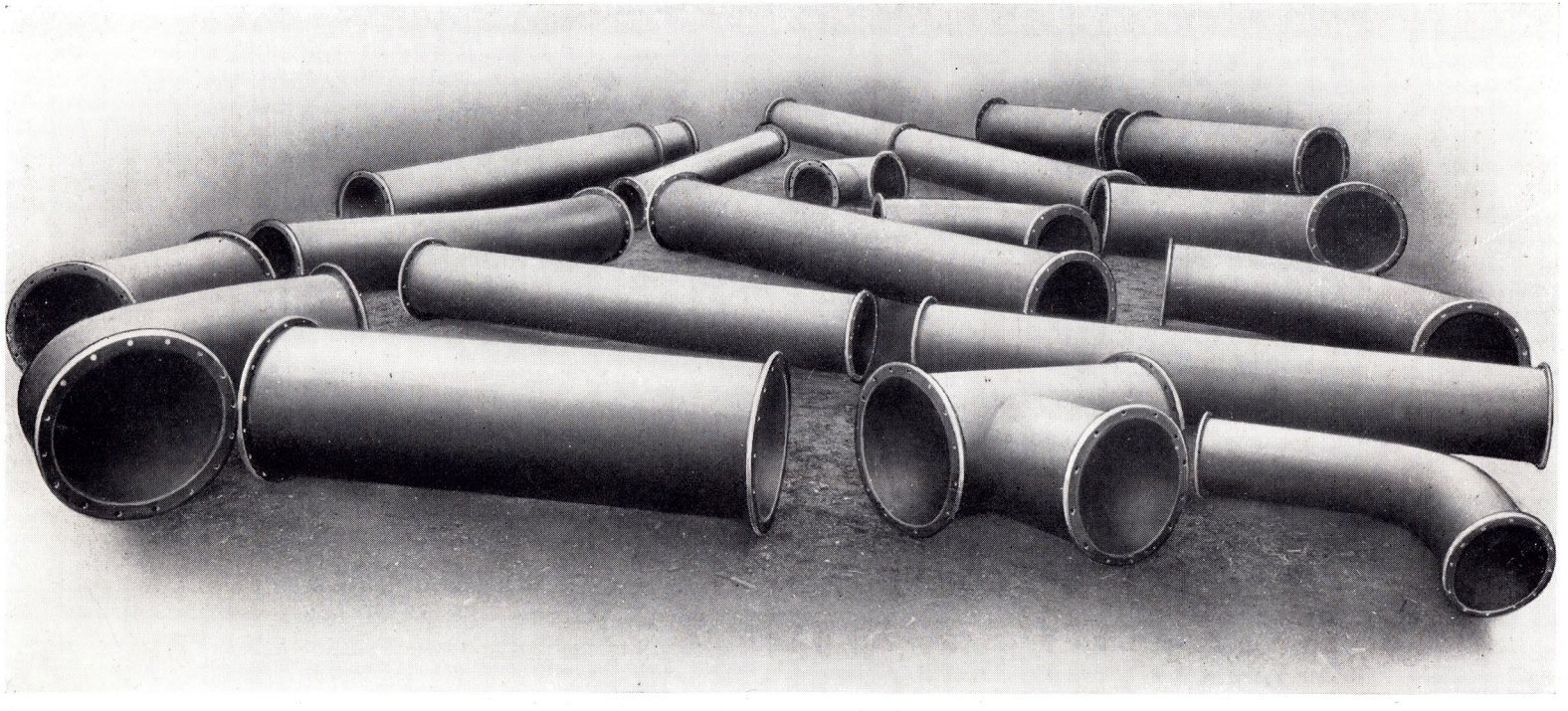
FOR ANY PRESSURE, WITH FLANGES SCREWED & EXPANDED OR WELDED ON.

*Complete Installations a Speciality.*

DESIGNED, MANUFACTURED AND ERECTED.

Constructed to pass the requirements of :—BRITISH ADMIRALTY, BOARD OF TRADE, LLOYDS, BUREAU VERITAS, BRITISH CORPORATION, AND ALL THE LEADING INSURANCE COMPANIES.

VALVES, SEPARATORS, STEAM TRAPS, EXPANSION JOINTS, EXHAUST HEADS, PUMPS, INJECTORS, FEED WATER HEATERS, COOLERS, FILTERS, EVAPORATORS, OIL HEATERS AND STRAINERS.



MAINS FOR OIL, AIR, GAS, AND WATER FOR ALL PRESSURES.

COILS OF EVERY DESCRIPTION FOR REFRIGERATOR PLANTS, CHEMICAL PLANTS AND PROCESS WORK.

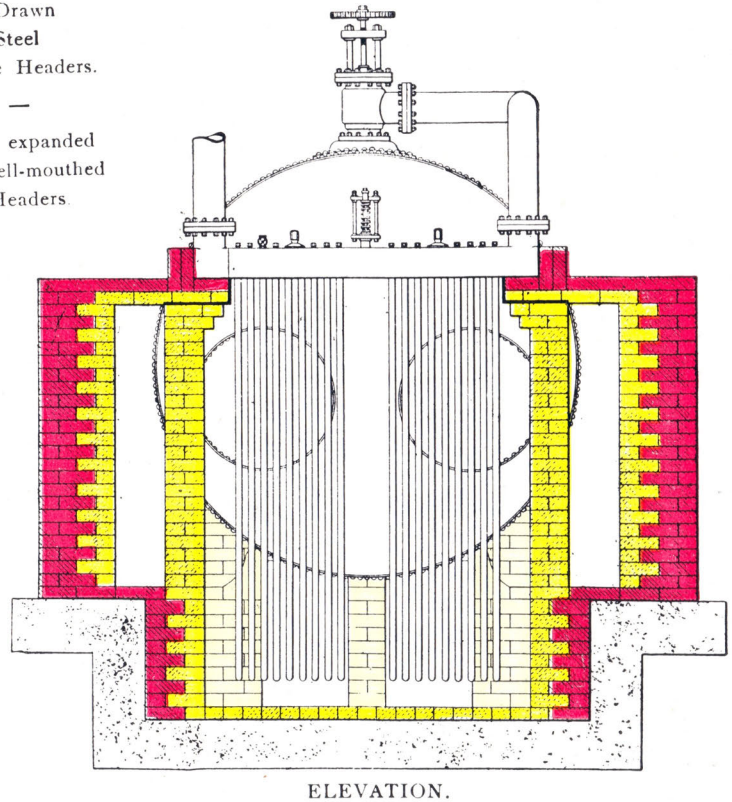
*WORKS:* ALICE ST., BILSTON, STAFFS. 'PHONE 92 BILSTON.

# The "John Thompson" Standard Superheater.

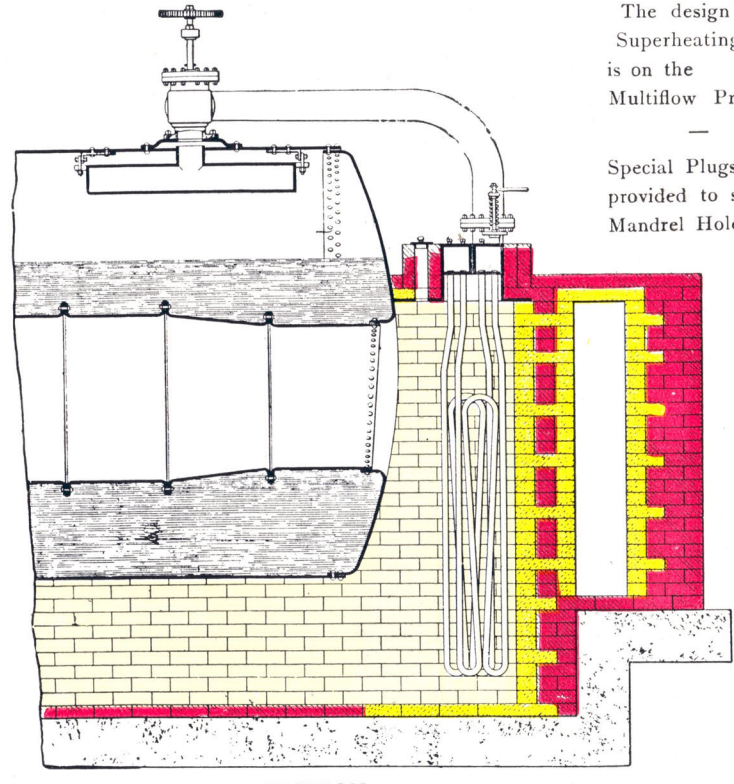
Solid Drawn
Mild Steel
Square Headers.

—

Tubes expanded
and bell-mouthed
into Headers.



ELEVATION.



SECTION.

The design of
Superheating Tubes
is on the
Multiflow Principle.

—

Special Plugs
provided to seal
Mandrel Holes.

This design of SUPERHEATER IS EASILY ADAPTED TO:—
LANCASHIRE, WATERTUBE, DRYBACK, CORNISH, VERTICAL, AND MULTITUBULAR BOILERS, AND ALSO INDEPENDENTLY-FIRED SUPERHEATERS.

We also manufacture SECTIONAL TYPE SUPERHEATERS, to suit the wishes of Clients.

**CONSTRUCTED TO LAST.**

# SUPERHEATED STEAM.

TO meet the ever-increasing keenness of Competition, it is the paramount duty of those in charge of Boiler House Plants, in all Branches of INDUSTRY, to see that they are producing power at the MINIMUM COST. There are many ways of effecting ECONOMIES in Steam Plants, but the utilization of SUPERHEATED STEAM excels them all, and stands PRE-EMINENT.

The following table gives interesting figures upon the saving effected by using Superheated Steam.

## VOLUME AND SAVING OF SUPERHEATED STEAM

| Pressure in lbs. per Square Inch. | Temperature on the Fahr. Scale in Degrees. | Temperature on the Centigrade Scale in Degrees. | Volume of 1-lb. of Saturated Steam in Cubic Feet. | Volume of 1-lb. of Steam Superheated 100° Fahr. in Cubic Feet. | Volume of 1-lb. of Steam Superheated 150° Fahr. in Cubic Feet. | Volume of 1-lb. of Steam Superheated 200° Fahr. in Cubic Feet. |
|---|---|---|---|---|---|---|
| 50 | 297·8 | 147 | 6·52 | 7·49 | 7·95 | 8·35 |
| 100 | 338 | 169·2 | 13·8 | 4·38 | 4·64 | 4·87 |
| 120 | 350 | 175·5 | 3·27 | 3·76 | 3·98 | 4·18 |
| 160 | 370 | 188 | 2·91 | 2·94 | 3·12 | 3·27 |
| 180 | 379 | 193 | 2·31 | 2·65 | 2·81 | 2·95 |
| 200 | 386 | 197·3 | 2·10 | 2·41 | 2·56 | 2·68 |

ECONOMY IN STEAM CONSUMPTION.

| Degrees of Superheat (Fahrenheit). | SLOW SPEED ENGINES. | | HIGH SPEED ENGINES. | |
|---|---|---|---|---|
| | Average Consumption in lbs. per hour per 1-H.P. | Average Percentage Saving in Steam. | Average Consumption in lbs. per hour per 1-HP. | Average Percentage Saving in Steam. |
| Saturated Superheat added. | 14 | ... | 15 | ... |
| 50° Fah. | 13 | 7% | 14 | 6·5% |
| 100° Fah. | 12 | 14% | 13 | 13% |
| 150° Fah. | 11 | 21% | 12 | 20% |
| 200° Fah. | 10 | 27% | 11 | 26% |
| 250° Fah. | 9·5 | 32% | 10·5 | 30% |

When used in connection with TURBINES and ENGINES, the saving in Steam Consumption may be taken as not less than 1% for each 10° Fahrenheit of Superheat.

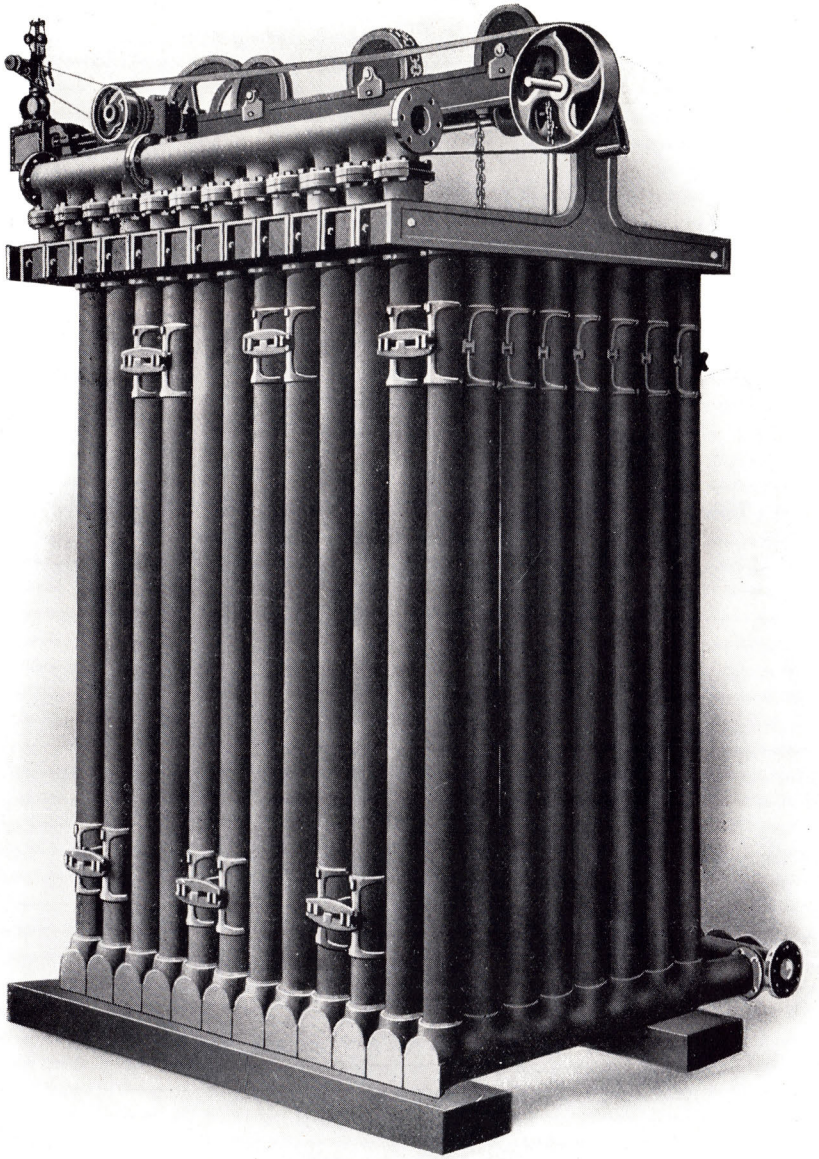
## ADVANTAGES OF SUPERHEATED STEAM.

1. Greater Thermal Efficiency of STEAM ENGINES.
2. DUTY of BOILERS INCREASED 10% to 20% according to operating conditions of Plant.
3. Condensation in Engine Cylinders and STEAM RANGES eliminated.
4. Smaller Steam Pipes can be used to convey the same weight of Steam, owing to the Greater Mobility of Superheated Steam. Smaller Valves may be used in consequence, reducing cost of installation.
5. HEATING, DRYING and BOILING operations done at much less cost, and more quickly.

THESE POINTS ARE WORTH YOUR CONSIDERATION and SHOW WHY YOU SHOULD SUPERHEAT.

We have had over 20 years' experience in Superheating, and we place the services of our Technical Staff at your disposal.

Boiler Accessories
Department.



# "Fuel Economiser"

With Patent Scrapers.

# "FUEL ECONOMISER."

It is a well-known fact, that in the practical working of Steam Boilers, there is, in all cases, a considerable amount of heat escaping up the chimney—this can be arrested and utilised for heating Feed Water.

The Fuel Economiser is specially designed for using up the waste heat from the Boilers, and consists of sections of cast-iron pipes 9-ft. long × $4\frac{9}{16}$-in. diameter, made up into sets of 4, 6, 8 and 10 pipes wide.

By the application of this Apparatus, which is placed in the main flue behind the Boilers, a large saving is effected in fuel, and the feed water is in some cases heated nearly to the point of evaporation.

**ADVANTAGES SECURED**

1. **A Positive Saving in Coal.**
2. Large supply of water in reserve at nearly evaporation point, ready for delivery to the boilers.
3. **Utilisation of Heat; which would otherwise be lost.**
4. Prevention of unequal expansion and contraction in boilers, thus avoiding strains and repairs and thereby increasing the life of the boilers.
5. Purification of Feed Water.
6. Additional heating surface and increased steaming capacity.

We shall be pleased to inspect existing Steam Plant, and offer suggestions for Economising Fuel, by utilising waste heat; and making a report free of cost.

| BOILER. | | | | | SIZE OF FUEL ECONOMISER. | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DIMENSIONS OF BOILER. | | | | EVAPORATION IN LBS. OF WATER PER HOUR. | NUMBER OF TUBES REQUIRED PER BOILER. | PIPES LONG. | PIPES WIDE. | LENGTH OVER PIPES. | | WIDTH INSIDE WALLS. | | HEATING SURFACE IN SQUARE FEET. |
| LENGTH. | | DIAMETER. | | | | | | | | | | |
| Ft. | Ins. | Ft. | Ins. | | | | | Ft. | Ins. | Ft. | Ins. | |
| 30 | 0 | 9 | 3 | 10,000 | 128 | 16 | 8 | 9 | 8 | 6 | 9 | 1,280 |
| 30 | 0 | 8 | 6 | 9,750 | 120 | 12 | 10 | 7 | 3 | 8 | 1 | 1,200 |
| 30 | 0 | 8 | 3 | 9,500 | 120 | 12 | 10 | 7 | 3 | 8 | 1 | 1,000 |
| 28 | 0 | 8 | 3 | 7,500 | 96 | 12 | 8 | 7 | 3 | 6 | 9 | 960 |
| 30 | 0 | 7 | 6 | 6,500 | 96 | 12 | 8 | 7 | 3 | 6 | 9 | 960 |
| 28 | 0 | 7 | 6 | 5,750 | 96 | 12 | 8 | 7 | 3 | 6 | 9 | 960 |
| 28 | 0 | 7 | 3 | 5,000 | 72 | 12 | 6 | 7 | 3 | 5 | 5 | 720 |
| 24 | 0 | 7 | 3 | 4,600 | 72 | 12 | 6 | 7 | 3 | 5 | 5 | 720 |
| 24 | 0 | 6 | 6 | 4,200 | 72 | 12 | 6 | 7 | 3 | 5 | 5 | 720 |

**NOTE.—The sizes of the Economisers given above include the usual inspection passage at the back of same. The height over gearing is 13-ft. 6-in., and the sections 10-ft. $2\frac{1}{4}$-in.**

# L.C.C. Forced Draught Furnaces.

The efficient working of a Boiler is governed by the regulation of the air supply to Furnace.

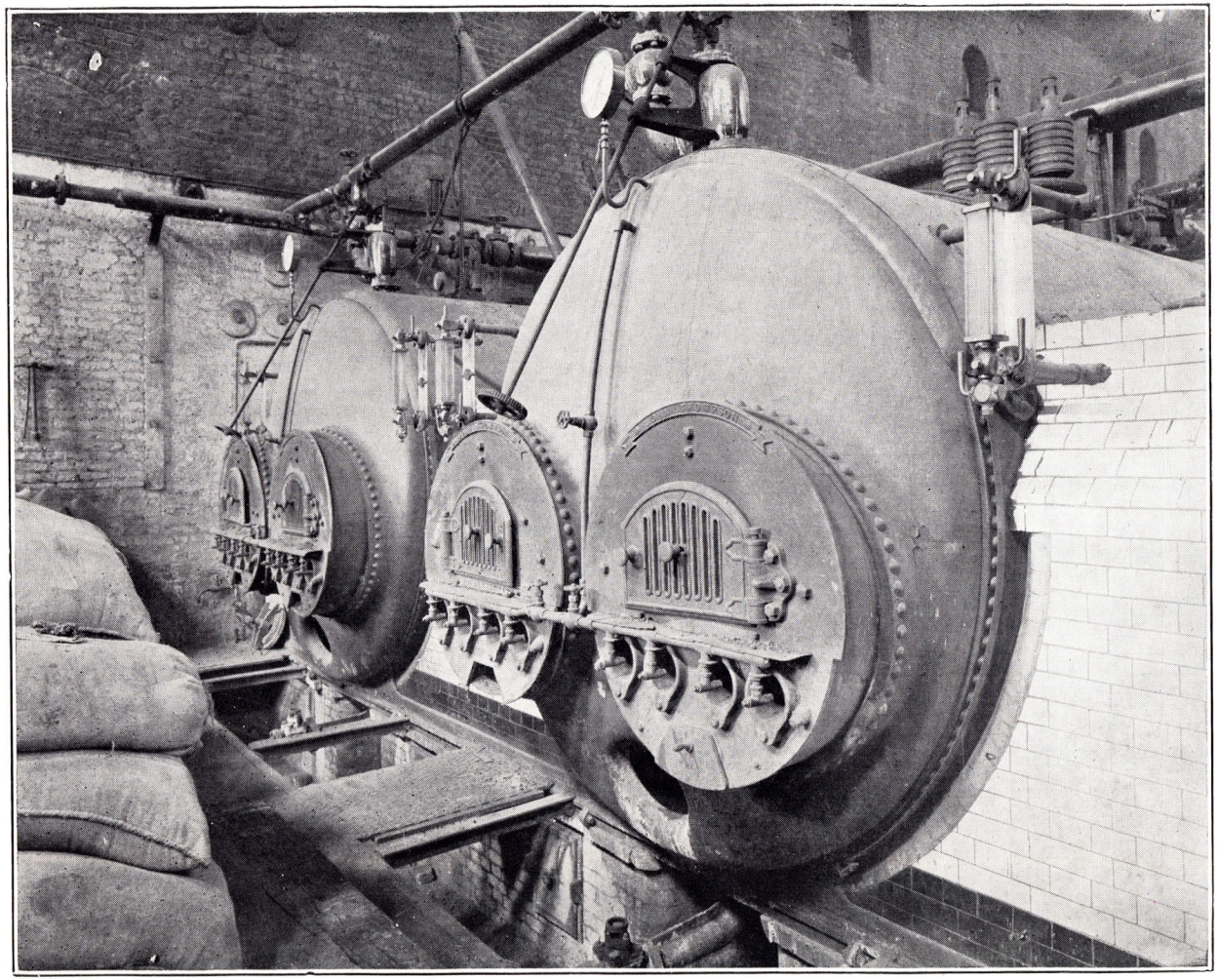
Forced draught enables Boilers to consume inferior fuels, such as small coal, coke, breeze, and coal dust, which it would be impossible to burn with ordinary chimney draught, the higher rate of combustion compensating for the lower evaporating value of these fuels. With forced draught, of all the points relating to economy and efficient working, there are none so vital as air and damper regulation ; by partly closing the dampers, the heated gases are kept in contact with the Boiler and its flues for a long period, and consequently enter the chimney much reduced in temperature.

After careful experiments, the London Coke Committee designed the L.C.C. Forced Draught Furnace, of which we are Licensees. Extreme care and attention has been given to the construction of the steam jets and blowers, and some thousands of these Furnaces have been fitted, and are giving entire satisfaction under working conditions.

The Relation between the percentage of $CO_2$ in the Flue Gases, the number of times the theoretical amount of Air required for Combustion and the loss of fuel is shown on following table :

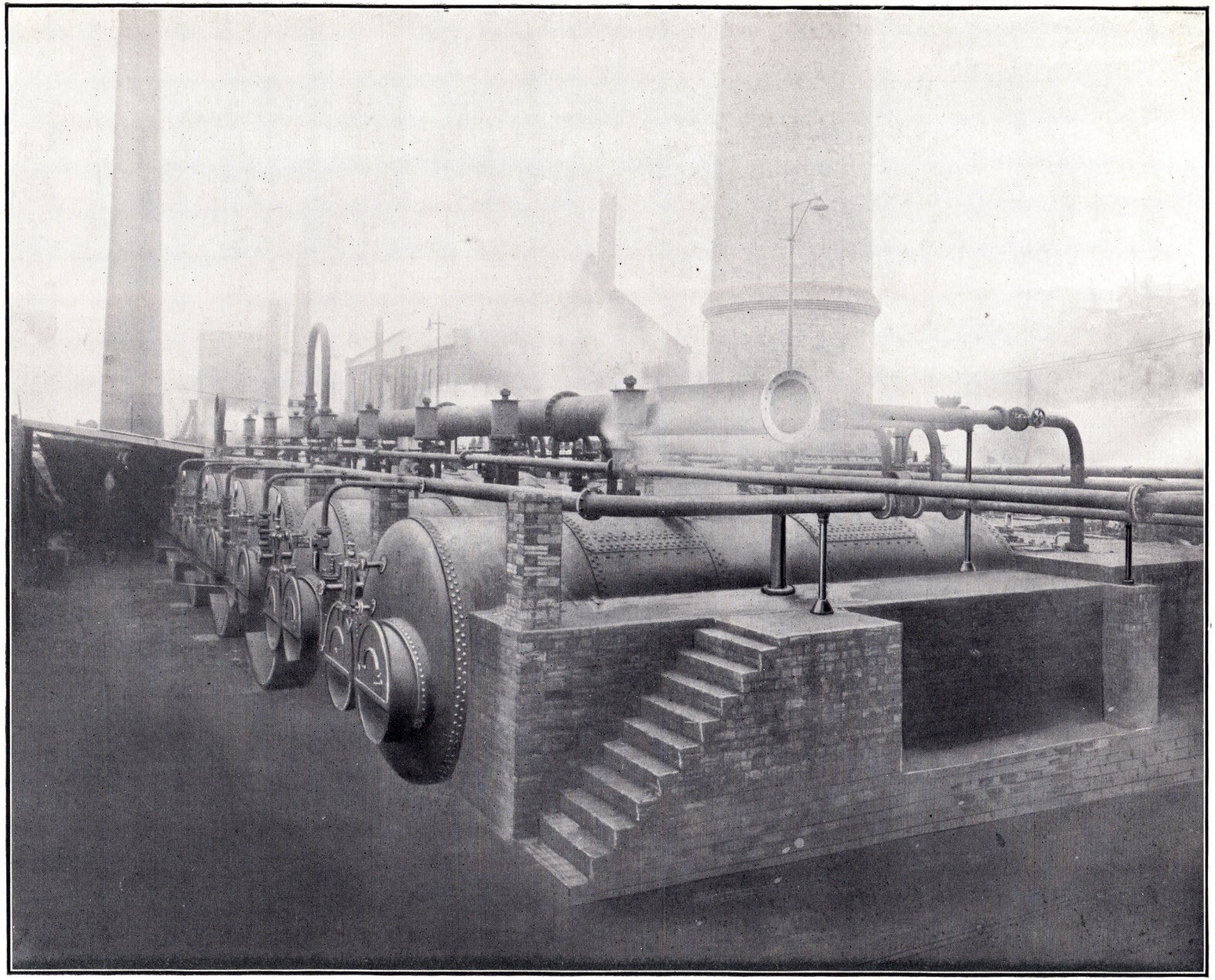
| $CO_2$ in Flue Gases % - - - | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|
| Amount of air times theoretical requirement - | 2·4 | 2·1 | 1·9 | 1·7 | 1·6 | 1·5 | 1·4 | 1·3 |
| % of Fuel lost - - - - | 23 | 20 | 18 | 16 | 15 | 14 | 13 | 12 |

**Drawings and Specifications sent on application.**

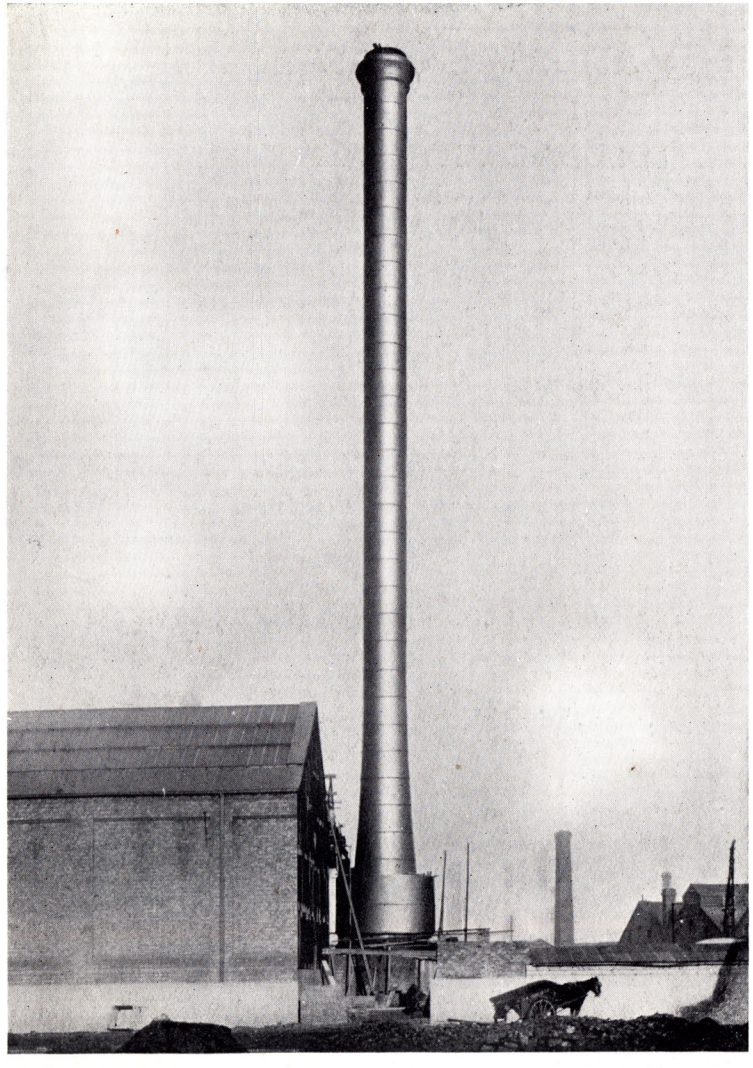


**TWO "JOHN THOMPSON" LANCASHIRE BOILERS (with Dished Ends).**

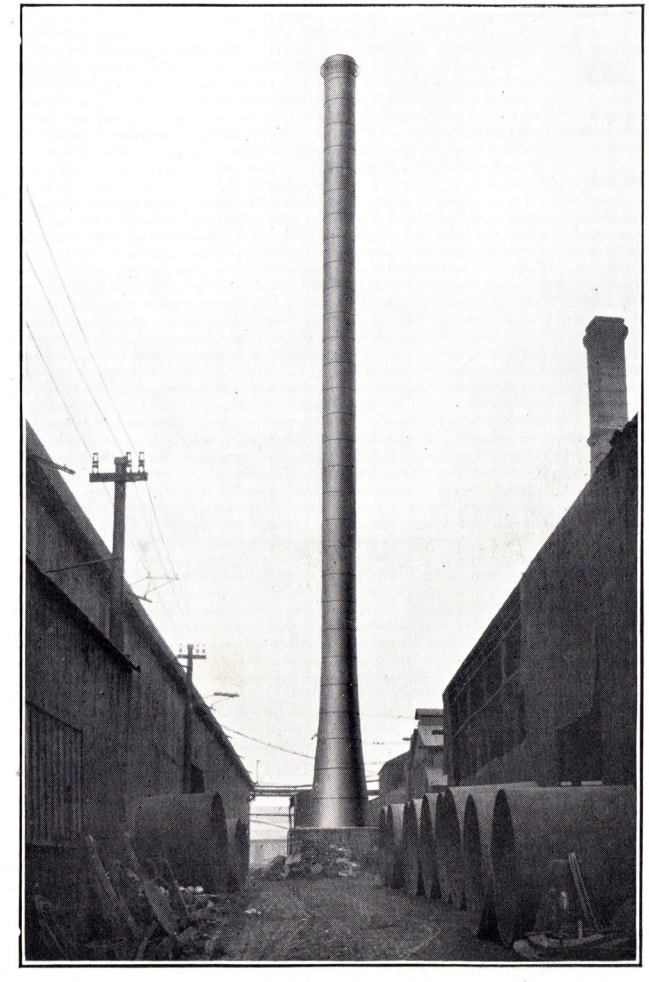
Fitted with "L.C.C." Furnaces, supplied to the Works of one of the largest London Public Utility Undertakings.



**12 "JOHN THOMPSON" DISH-END BOILERS,** 30-ft. long × 9-ft.3-in. dia., suitable for 175lbs. Working Pressure, fitted with Corrugated Flues throughout, working at a large Colliery at Llwynypia, South Wales.



"JOHN THOMPSON" SELF-SUPPORTING STEEL CHIMNEY.
180 feet high, 8 feet diameter at top.



"JOHN THOMPSON" SELF-SUPPORTING STEEL CHIMNEY.
150 feet high × 6 feet 6 inches diameter at top.

## We make a SPECIALITY of these Steel Chimneys.

***Special Chimney Catalogue will be provided on application.***

# Goods Manufactured by our Various Departments.

## BOILER DEPARTMENT.

"John Thompson" Boiler (with Dished-Ends and Corrugated Flues)
Ordinary Flat-Ended Lancashire.
"John Thompson" Dish-Ended Cornish.
Ordinary Flat-Ended Cornish.
"John Thompson" "Economic" Dry Back.
Externally Fired Multitubular.
Vertical and Colonial.

## BOILER ACCESSORIES DEPARTMENT.

Superheaters. Economisers.
Forced Draught Furnaces.
Rocking Firebars.
Feed Water Heaters.
Mechanical Stokers.
"Simplet" Patent Circulators.
Boiler Covering Composition.
Complete Pipe Ranges.
Feed Pumps. Injectors.
Draught Gauges. Recorders.
Complete Brickwork Settings.

## STEEL WORKS DEPARTMENT.

Complete Rolling Mill Plants for Sheets, Bars, Angles, Flats, Rounds, etc.
Tube Making Plants.
Charging Boxes. Cradles.
Converters.
Foundry Ladles. Cupolas.

## ANNEALING PLANT DEPARTMENT.

Iron Work for Furnaces.
Corrugated Covers and Pans.
Annealing Plants.
Underground Travellers, etc.

## CORRUGATING PLANTS.

Complete Machinery for Rolling all Types of Corrugated Sections.

## WELDED DEPARTMENT.

Welded Buoys up to 10ft. dia.
Welded Storeholders up to 50ft. long.
Welded Creosoting Cylinders.
Welded Chemical and Tar Stills.
Welded Railway Tanks for Petroleum, Castor Oil and Compressed Gas.
Welded Tanks and Cylinders.
Air Receivers.

## LEAD LINING DEPARTMENT.

Homogeneously Lead-Lined Vessels for Chemical Works, Lead-Lined Tanks, Vacuum Pans, Condensers, Autoclaves, Scrubbers, Pipes, etc.

## GALVANIZING PLANT DEPARTMENT

Galvanizing Baths of all sizes.
Galvanizing Machines.
Drossing Pots.
Corrugating Machines.
Curving Machines (Three and Four-Roll).
Flattening Machines (Seven-Roll) and Shears.
Hydraulic Stretching Machines.

## CORRUGATING DEPARTMENT.

Corrugated Flue Sections (for Land and Marine Boilers), various Types, "FOX," "MORRISON," "DEIGHTON," etc. (with Stephen Gourlay Ends, or wing type flanges).

## GENERAL DEPARTMENT.

Bone Digesters and Extractors.
Evaporating Tanks and Condensors.
Air Receivers (Rivetted).

STEAM PLANTS Inspected and Reported upon as to Economical Working.